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(71) Applicant: Balay S.A.
50059 Zaragoza (ES)

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(72) Inventor: Boved, Ismael Gracia
50059 Zaragoza (ES)

(54) Closing system in plastic tank for washing machine

(57) Closing system in plastic tank for washing machine, being of the kind of those formed by two halves that are obtained from a mould, staying their bases of union open, so that the two halves -(1) and (2)- that define the tank of the washing machine through their union, in relationship to their bases of union, have the means of closing and which coincide among them, so that one of the halves (2) -that forms the washing

machine joined the other half (1)- has an axial projections (7) like a tip of harpoon, placed in relationship to the perimeter of its base of union, while the other half (1) that forms the tank of the washing machine has a set of radial cavities (8) like a reversed U that form an orifice (9) of rectangular section.

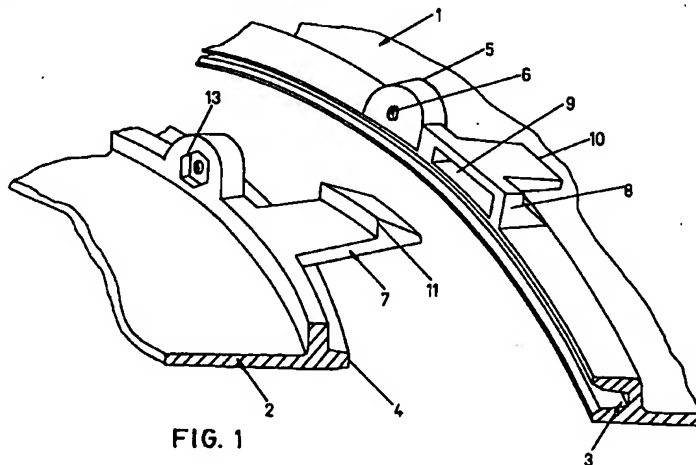


FIG. 1

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Description

OBJECT OF THE INVENTION.

The following invention, like it is expressed in the enunciation of this descriptive report, consists of a closing system in plastic tank for washing machine that is of the kind of those which are made up of two halves that are joined by their central perimeters so that the two halves of the tank can be separated. It is shaped by the service of technical assistance so it can be manipulated if there is a breakdown.

Through the closing system proposed in the present report for its application in the union of the two halves of a plastic tank for washing machine, it is considerably reduced the time spent in such operation and the material cost of the same, which reduce drastically the total cost of the tank.

On the other hand, the system of union allows the fast and simple separation of both halves, and their following union through conventional screws.

In fact, it is considered to have a cheap closing system of the two halves of a plastic tank for a washing machine, that allows the separation and following union of the two halves in those exceptional cases where the tank of the washing machine must be manipulated by the service of technical assistance because of technical reasons.

FIELD OF APPLICATION.

The closing system that is showed in the following report can be applied in the closing of the two halves of a tank for washing machine made of plastic material, so that both halves are obtained from a mould, and for their manufacture, it is not necessary to increase the complexity of the mould because the elements which materialize the union are obtained from a mould too, and they do not put up the cost of the mould or the product.

In this way, the two halves of the tank form its structure because of their union through their central perimeters, with the insertion of the joint of watertight, so that while the base of one of the halves is open for staying in relationship to the door of the washing machine, the base of the other half determines the back closed part that is endowed of an axial and central orifice that allows the entry of the spindle of the drum.

BACKGROUND OF THE INVENTION.

Generally speaking, the plastic tanks of washing machines are manufactured from a mould which has two halves that when are joined, form the tank of the washing machine where the drum will be placed, so that in the manufactured of the own body of the tank, the accessory elements for its subjection and for the union among other elements are determined, so that the union between the two halves is produced, for shaping an hermetic body.

Thus, the two halves that shape the body of the tank, are joined through their central perimeters so that the base of one of the halves is open for staying in relationship to the frontal part of the washing machine, and the other half determines the back part of the tank, having an axial central orifice that allows the entry of the spindle of the drum which is placed into the tank.

For joining the two halves of the tank to the open base, it is necessary to determine some radial lugs endowed of some orifices for the threaded of the respective screws which will do the union.

Also, there is a seal placed between both bodies which will guarantee an hermetic closing.

In this way, the union between both halves is did by a set of screws, so that one or several workers must thread the screws. For joining both halves, it is necessary to spend much time because we have to use approximately 17 screws.

With this configuration, we have to count on the use of the number of screws that we have cited, with the cost that it represents and a lot of time that we have to spend in the threaded of all of them. This represents a high cost as a consequence of the added value of the screws that are utilized and the cost of the workers necessary to carry out the operation of closing.

In this way, if the tank of the washing machine must be disassembled because of technical motives, its two halves can be separated when all the screws of fixing are unscrewed, and later it can be assembled when the two halves that form the tank stay fixed through the screws of union.

DESCRIPTION OF THE INVENTION.

In the present report, a closing system in plastic tank for washing machine is described. This tank is formed by two halves obtained from a mould, so that the bases of both halves -those bases that are going to be joined- stay open while the second base of one of the halves of the tank determine the frontal part that remains in relationship to the door of the washing machine, and the second base of the other half determine the closed back part of the tank by an axial central orifice which allows the entry of the spindle of the drum so that the bases of union of both halves have the means of closing and fixing which coincide.

The means of closing of one of the two halves that form the plastic tank, are determined by some axial projections, like tip of harpoon, placed in relationship to the perimeter of its base of union.

On the other hand, the means of closing of the other half of the plastic tank of the washing machine are determined by some radial cavities from the perimeter of the base of union, which have form of reversed U and they determine a rectangular orifice, so that in relationship to their upper internal side, they have a projecting prolongation which internal side determine a slope of diminishing height that is terminated of flat form, parallel to the perimeter of the tank.

The height of the orifice determined by the radial cavities of one of the halves that shape the tank like a reversed U is bigger than the width of the axial projections of the other half of the tank, with form of tip of harpoon, so that when the said projections intrude in their corresponding orifice stay with their external flange bumping into the free extreme of the projecting prolongation. Besides, this prolongation defines a slope towards the inside that, in its union with the projection like a tip of harpoon, defines a hollow which allows the insertion of a screw or a similar tool for making its separation easy because the pressure that is exercised by the seal determines the easy separation of both halves.

With this structure and with the introduction of the tip of the screwdriver or a similar tool, it is allowed to bend and to separate the prolongation of the radial cavities like a reversed U and the axial projections in form of tip of harpoon of the other half of the tank for causing their liberation because of the pressure practised by the seal of watertight

The described form of closing let eliminate the conventional screws utilized for the closing of the two halves of the plastic tank that are obtained from a mould. This form of closing represents an important saving of used material because the closing is carried out when both halves are put face to face and all the axial projections like tip of harpoon of one of the halves of the tank are introduced in the corresponding lodging of the other half of the tank, which also represents a very important saving of time of execution of the said operation. Both savings reduce the cost of industrialization of the tank in a radical way.

On the other side, in those exceptional cases where the tank must be disassembled by the service of technical assistance, the new closing is carried out through the conventional screws because the two halves of the tank have some conventional lugs with some orifices for introducing the screws of closing and fixing, so that the anchorage of the axial projections like tip of harpoon in their corresponding lodgings, is accomplished when the screws are threaded.

To complement the description that goes to be realized and to help to understand its characteristics, this descriptive report is enclosed for a set of drawings made up of some figures that represent, in a way illustrative and not limitative, the most significant details of the invention described in the present report.

BRIEF DESCRIPTION OF THE DESIGNS.

Figure 1. It shows a view in perspective of one of the utilized elements for the fixing of the two halves of the tank, showing how it has a projection terminated like a tip of harpoon -in an axial way in regard to one of the open bases of one half of the tank- while the other half of the tank has a lodging for the insertion of the cited projections. Likewise, we can observe the radial lugs are endowed of their respective orifices.

Figure 2. It shows a plan view of one of the halves of

the tank whose element of union is defined by an axial projection like a tip of harpoon which projects beyond the profile of the base of the half of the corresponding tank.

Figure 3. It shows a plan view of the other half of the tank. An element of union is defined in relationship to this half. This element of union is formed by a lodging of rectangular section that is endowed of a projecting prolongation which is placed over its upper part so that the element of closing of the other half of the tank run into this prolongation.

Figure 4. It shows a plan view of the union of the two halves of the tank, so that the realization of the closing is produced through the axial projection like a tip of harpoon of one of the halves of the tank which is introduced into the lodging of the other half of the tank.

Figure 5. -It shows a sectional view, in accordance with the section I-I of the figure 2, where we can see the axial projection that is topped like a tip of harpoon for its fixing to the element of closing of the other half of the tank of the washing machine.

Figure 6. -It shows a sectional view, in accordance with the section II-II of the figure 3, where we can see the radial cavity of one half of the tank define an orifice of rectangular section that allows the pass of the corresponding axial projection of the other half of the tank, which has a projecting flange on its upper side.

Figure 7. -It shows a sectional view, in accordance with the section III-III of the figure 4, where we can see the form of anchorage of an element relative to both halves of the tank. In this way, we can observe there is a little hollow between the elements of closing and fixing.

DESCRIPTION OF A PREFERRED EMBODIMENT.

In view of the above cited figures, and in accordance with the numbering used, we can see how the plastic tank of the washing machine is made up of two halves -(1) and (2)- obtained from a mould having their bases of union open, while the other base of one of them defines the frontal part of the tank which remains in relationship to the door of the washing machine, and the other base of the second half defines the back closed base of the tank, that is endowed of a central axial orifice which allows the entry of of the spindle of the drum.

In relationship to the perimeter of the base of union of both halves -(1) and (2)- that form the tank of the washing machine, one of them defines a lodging (3) where the corresponding seal is placed. This seal is united to a projection (4) of the other half that is going to be joined. Moreover, the two bases which are going to be joined have a set of lugs (5) -placed over their respective perimeters- which are endowed of respective orifices (6) so that the orifices of one of the bases of union coincide with the orifices of the other base. In this way, the closing and fixing of the two halves of the tank will be carried out through some screws so that each one go through both orifices.

The cost of this kind of closing goes up because of the cost of the utilized screws approximately 17 screws- and the time that we have to spend in the thread of all of them.

The closing system that is described in the present report has been thought for solving these obstacles. Through this system, the two halves of the tank -(1) and (2)- are provided of the means of closing during their process of manufacture through mould. In this way, one of the halves (2) of the tank has a set of axial projections like a tip of harpoon which are placed over the perimeter of its base of union, while the other half (1) of the tank has a set of cavities (8) like a reversed U which are placed, in a radial way, over the perimeter of its base of union. These cavities (8) have respective orifices (9) that will coincide with the cited axial projections (7) of the other half.

Likewise and in relationship to their upper internal side, the cavities (8) like a reversed U have a projecting prolongation (10) whose internal side defines an inclined plane at the start and it tops, in a parallel and line way, the perimeter of the tank so that, as the height of the orifice (9) defined by the cavities (8) is smaller than the width of the axial projections (7) like tip of harpoon, when these pass through the orifices (9), the free extreme of the said prolongation (10) runs up against the extreme flange (11) of the projections (7) at the same time as the cited projections (7) stay running up against the line stretch of the projecting prolongation (10).

For realizing the cited unions, it will be used a press so that an only punch will produce the simultaneous anchorage of all the axial projections (7) of the half (2) of the tank into the corresponding orifices (9) of the cavities (8) of the other half of the tank, in collaboration with the projecting prolongation (10), because of the pressure that must be realized to realize the closing, obtaining the watertight by means of the joint placed in the lodging (3) and where the projection (4) of the other half of the tank tops.

As a consequence of the conjunction of the cavities (8) and their corresponding prolongations (10) as soon as the projecting positioning of the axial projections (7), a lodging (12) is formed because of their union so that if a screwdriver or a similar element is introduced into this lodging, the separation between the projection (7) and the prolongation (10) will be realized. In this way and because of the simple pressure exercised by the joint, the projection (7) stays liberated so that the disassembly of both halves is fast and simple.

The cost of the tank of the washing machine is substantially reduced with this kind of closing because all the screws, that are utilized in a conventional way for joining the two halves of the tank are eliminated, and also because of the saving of time because with this system, the simultaneous anchorage of all the elements of closing is realized with an only punch of press.

On the other side, in those exceptional cases where the two halves must be separated by the service of tech-

nical assistance, with the described system the new closing of the two halves will be realized through some screws, such as it is usually realized, because the two halves of the tanks have some lugs (5) with their corresponding orifices (6) and for making their anchorage easy, one of the pairs of lugs that are confronted have a polygonal orifice (13) where the head of the corresponding screw will be inserted.

10 Claims

1. CLOSING SYSTEM IN PLASTIC TANK FOR WASHING MACHINE, being of the kind of those plastic tanks that are formed by two halves obtained through a mould, so that their bases of union stay open while the other base of one of the halves defines the frontal part of the tank which stays in relationship to the door of the washing machine, and the other base of the second half defines the back part of the closed tank with an axial central orifice that allows the pass of the spindle of the drum. This system is characterized because the two halves -(1) and (2)- that form the tank of the washing machine when they are joined, have the means of closing and fixing that coincide between them. These means are placed in their bases of union.
2. CLOSING SYSTEM IN PLASTIC TANK FOR WASHING MACHINE, according to the first claim, that is characterized because the means of closing of one of the halves (2) of the tank of the washing machine are defined by some axial projections (7) like a tip of harpoon, that are placed in relationship to the perimeter of its base of union.
3. CLOSING SYSTEM IN PLASTIC TANK FOR WASHING MACHINE, according to the first and second claims, that is characterized because the means of closing of the other half (1) of the tank of the washing machine are defined by a set of cavities (8) like a reversed U that define an orifice (9) of rectangular section.
4. CLOSING SYSTEM IN PLASTIC TANK FOR WASHING MACHINE, according to the first and third claims, characterized because the radial cavities (8) like a reversed U, have a prolongation (10) like a wing in relationship to their upper internal side, so that the said prolongation (10) defines an inclination -from its zone of birth- that converges towards the body of the tank, while its extreme is finished off in a straight way.
5. CLOSING SYSTEM IN PLASTIC TANK FOR WASHING MACHINE, according to the first, second and third claims, characterized because the high of the orifice (9) defined by the radial cavities (8) like a reversed U of one of the halves (1) of the

tank, is bigger than the width of the axial projections (7) of the other half (2) of the tank.

6. CLOSING SYSTEM IN PLASTIC TANK FOR WASHING MACHINE, according to the previous claims, characterized because in the closing of both halves (1) and (2) of the tank, the axial projections (7) like a tip of harpoon of one of the halves of the tank, stay with their extreme lug running into the free extreme of the projecting prolongation (10) of the cavities (8), being materialized the fixing and closing of both halves. 5 10
7. CLOSING SYSTEM IN PLASTIC TANK FOR WASHING MACHINE, according to the previous claims, characterized because the inclined plane of the internal side of the projecting prolongation (10) of the radial cavities (8) like a reversed U, define a hollow (12) in relationship to the corresponding projection (7) of closing and fixing of the other half. 15 20

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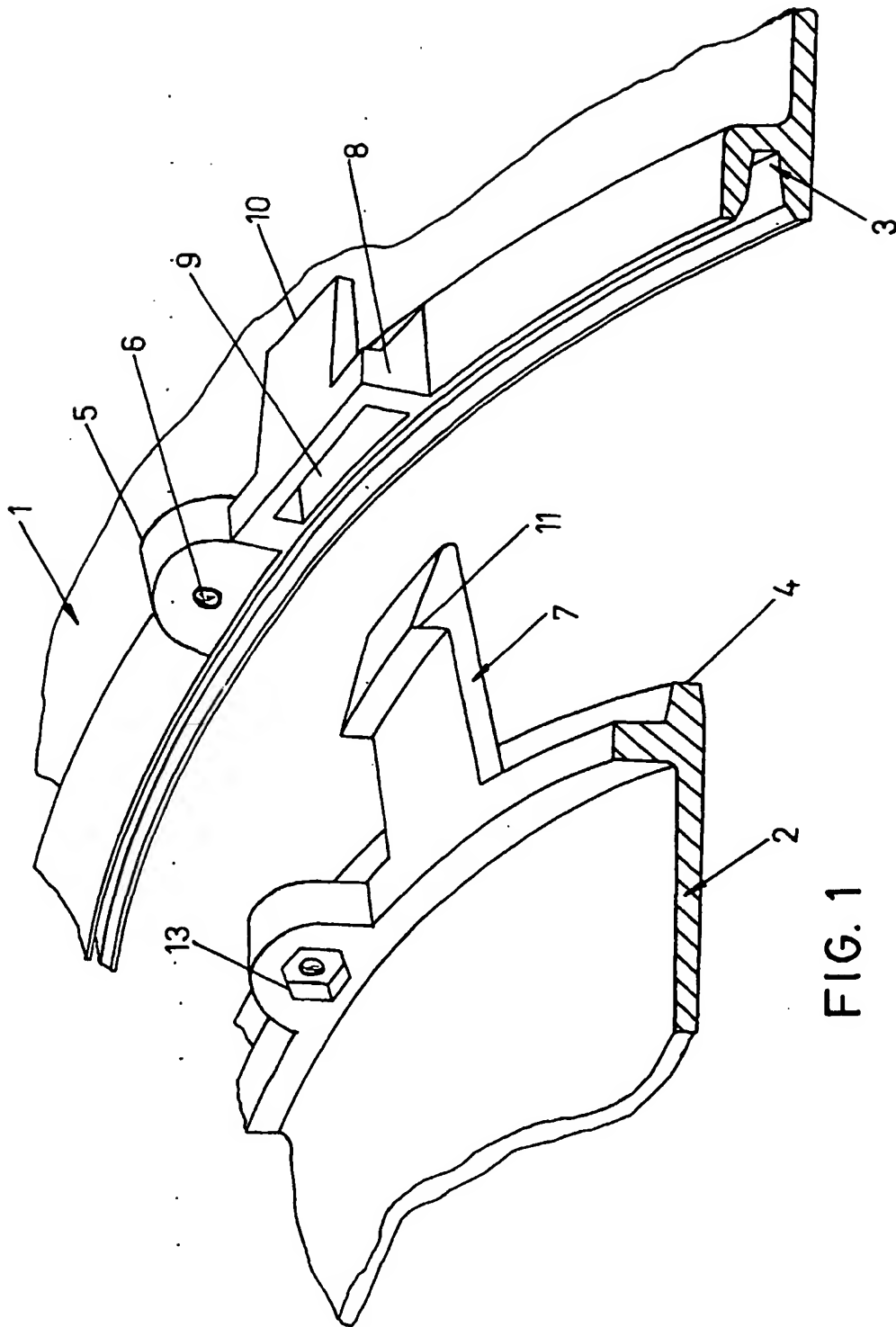


FIG. 1

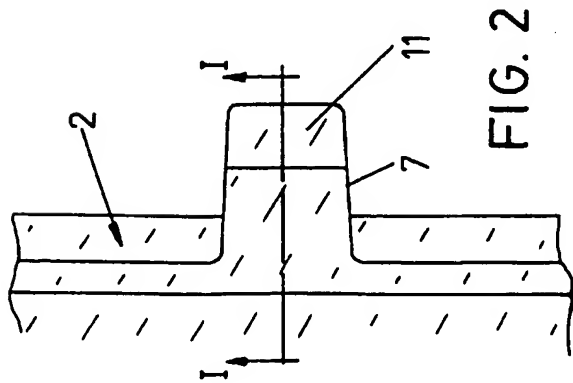


FIG. 2

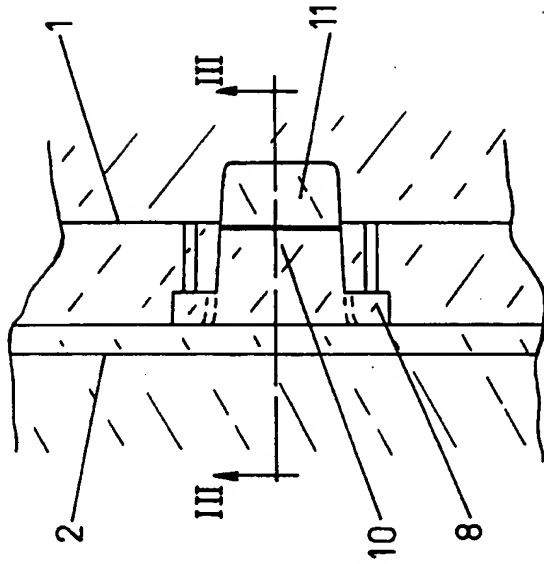


FIG. 4

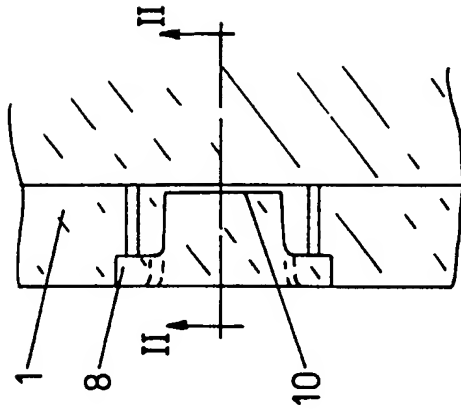


FIG. 3

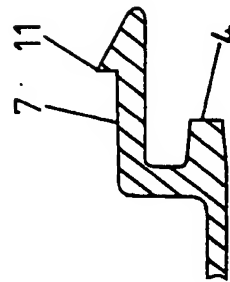


FIG. 5

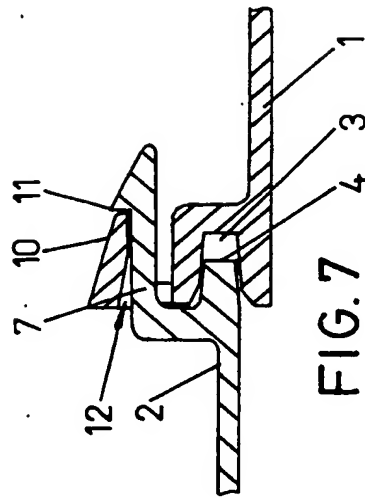


FIG. 7

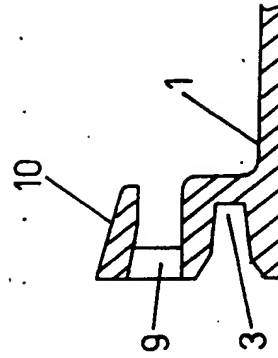


FIG. 6



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EUROPEAN SEARCH REPORT

Application Number
EP 96 50 0168

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	FR 1 513 957 A (ROBERT BOSCH HAUSGERÄTE G.M.B.H.)	1	D06F37/26
A	* page 2, column 2, line 44 - line 60; figures 2,3,6-11 *	2,6	
A	FR 2 606 798 A (CIAPEM) * claims; figures *	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6) D06F
Place of search THE HAGUE		Date of completion of the search 22 May 1997	Examiner Courrier, G
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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